

Observations of Interstellar Pick-Up Hydrogen

D. Winterhalter(1), G. Gloeckler(2), and E. J. Smith(1)

(1) Jet Propulsion Laboratory, California Institute of Technology
Pasadena, CA 91109-8099, USA. (2) University of Maryland
College Park, MD 20742-2425, USA.

Interstellar hydrogen is primarily ionized by charge exchange with solar wind protons, while interstellar helium is primarily photoionized. Utilizing Ulysses data taken at high helio-latitudes to minimize any contributions from large-scale solar wind dynamics, we analyze daily averages of the pick-up hydrogen flux and pick-up helium flux, as well as daily averages of the solar wind proton density and of the heliomagnetic field.

We find that the pick-up hydrogen flux in the northern heliosphere is significantly larger than in the southern heliosphere, for the period investigated. The difference in flux is increasing with increasing heliocentric distance from 1 to 5 AU. The north/south asymmetry appears not to be explainable by any difference in the charge exchange ionization rate, nor by any unusual wave activity or orientation of the magnetic field. Adding to the puzzle is the fact that the pick-up helium does not show any asymmetry. We will show the results of an analysis that uses the empirical solar irradiance model (SOLAR2000) in the search of the explanation for the asymmetry.

1. IAGA Meeting, Hanoi, Vietnam
- 2.
- 3.a) Daniel Winterhalter
Jet Propulsion Laboratory
MS 169-506
4800 Oak Grove Drive
Pasadena, CA 91109

b) Tel. 818 354-3238
c) Fax 818 354-8895
d) daniel.winterhalter@jpl.nasa.gov
- 4.
5. a) D. Winterhalter
5. b)
6. Oral
7. 0%
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9. Invited